Effect of antibiotic treatment of mares prior to transvaginal follicle aspiration on embryo development after in vitro oocyte maturation and intracytoplasmic sperm injection

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Transvaginal follicle aspiration (TVA) is commonly utilized to obtain oocytes from live mares for assisted fertilization techniques, such as intracytoplasmic sperm injection (ICSI). Ovarian abscess formation after multiple TVAs has been reported, although the incidence is low. Prophylactic administration of antibiotics before follicle aspiration might minimize the possibility of ovarian infection; however, since oocytes are exposed to frank blood during the aspiration procedure, our hypothesis was that systemic antibiotics may decrease the viability of aspirated oocytes. This study examined embryo development after ICSI of immature oocytes recovered from mares treated with systemic antibiotics before the TVA procedure. The study was done in December through February, to provide information for the next breeding season. Oocytes were recovered from all visible follicles of 10 mares either treated with ampicillin (2 mg/kg, IV) and gentamicin (6.6 mg/kg, IV) one time, within 10 minutes of the start of aspiration, or left untreated. Recovered oocytes were held in 40% M199 with Earle’s salts, 40% M199 with Hanks’ salts, and 20% FBS overnight and were then cultured in maturation medium (M199 with 10% fetal bovine serum and 5 mU/ml FSH) for 30 h. Oocytes having a visible polar body were injected with spermatozoa via Piezo drill, and presumptive embryos were examined for cleavage at Day 5 and for blastocyst development from Day 7 through Day 11. Aspiration was not performed unless >5 follicles ≥8 mm diameter were present. Mares were crossed over to the alternative treatment group after the first aspiration. A total of 16 aspirations were performed, seven in the control group (100 follicles) and nine in the antibiotic-treated group (128 follicles). There was no difference (P > 0.1; Fishers exact test) between the control and antibiotic-treated groups in recovery rate (59% and 66%, respectively); oocyte maturation rate (59% and 60%, respectively); cleavage rate (79% and 86%, respectively); or blastocyst rate (18% and 18%, respectively). These results indicate that systemic administration of antibiotics before TVA does not reduce the rates of maturation or embryo development of recovered oocytes. Oocytes recovered from immature follicles during the non-breeding season were capable of blastocyst development after ICSI.

Keywords: Equine, transvaginal aspiration, oocytes, antibiotics, intracytoplasmic sperm injection

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Reference